Technology and Young Children

Technology has…power to help students obtain, organize, manipulate, and display information…"
"Using technology for meaningful activities also helps integrate a variety of disciplines, more closely resembling activities that people undertake in the world beyond the classroom.
North Central Regional Education Laboratory, 1999

Technology can be defined as the use of a mechanical or electronic means to receive, send or process information. Technology tools might include telephone, television, video, camera, scanners, printers, computers, projection devices, laser disks, CD or be as simple as a calculator. Additional interactive technology might include: internet, e-mail, online discussion groups, video conference by fiber optics, or other formats, hand held devices, automobile communication systems, and cellular phones. These tools assist us in accessing and processing information. The speed, quality, and quantity of information we receive is then communicated to others.

Purpose

Learning takes place when multiple avenues of sensory input connect in the brain to past experiences. This information acquired by the learner then becomes integrated for use in problem solving, reasoning, exploration, analysis, interpretation, and the application of new knowledge.

Children need real-life experiences with real people to benefit from available technologies. Technology should be used to enhance curriculum and first hand experiences (Perry, 1999). Children require an integrated and well-balanced set of experiences to help them grow into capable adults who can handle social-emotional interactions as well as develop their intellectual abilities. When these take place at the appropriate time for the development of the child they become keys to healthy development. As with all other tools, adults must protect children from misuse or inappropriate use.

The purpose of technology is:

- To prepare students for a dynamically changing society
- To facilitate students achieving high standards and quality work
- To provide all students with equity in the availability of information
- To increase student achievement by addressing children's various learning styles
- To allow children to control selection, pace, and level of difficulty in processing information
- To provide interactive experiences which develop curiosity, problem solving and independent thinking skills
- To assist the child in the development of multiple ways to communicate
- To address the brain's preference for visually presented information
- To provide a tool for use in the investigative processes of learning
- To provide another way to communicate learning for assessment

Principles

As the convergence of technologies takes place in our society, the challenge for teachers and students is to develop a literacy with the tools of learning to prepare them for processing information. This improves communications, problem solving, critical questioning, researching, synthesizing and applying knowledge in new and unique ways.

In the use of technology the following principles are relevant to best practice for young children:

- Early childhood professionals use technology to facilitate student achievement.
- Selection of software and hardware is based upon relevance to curriculum, and software is absent of violence and stereotyping.
- Integration of technology with curriculum should be authentic and of interest to the learner.
- A technology rich environment encourages higher order thinking skills, problem solving and collaboration.
- Use of appropriate technology allows time for independent exploration and skill development.
- The selection of technology equipment and materials is based on needs and interests of each individual student.
- Multi-sensory technology tools address the learning styles and adaptive needs of the learner.
- Students using technology are involved in decision making regarding the application to and assessment of their work.
- Teachers acquire in depth professional development and support for implementing the use of technology.
- Equity of access to technology is provided for all learners.
- Educational communities work together to promote the appropriate uses of technology (NAEYC, 1996).

Research and Best Practice

When technologies are integrated into the curriculum as a vital element of instruction to solve real problems dealing with important issues, children gain the ability to use them as natural tools for learning just as they would a pencil, chalk, or paint brush (Shade & Watson, 1990). To maximize the potential of all tools of technology, they need to be viewed on the same level with our other instruments of instruction.

Computers and other equipment for learning need to be in the classroom as opposed to isolated to a hallway or specific room away from everyday activities. Children need to be able to choose the use of such technological tools based upon the work they have to accomplish. When these tools are isolated to laboratory settings for special purposes the impact of their potential is minimized. Their use then becomes a separate unrelated subject called “Computer Literacy.”

Interactive technologies become powerful tools when they are used to create multi-media presentations by students or teachers. Open-ended software can encourage children to articulate decision making and planning which leads to greater verbal interactions with others (Forman, 1994, video). The interactive software enhances the decision making process, extends math exploration and problem solving and supports social interactions with collaboration and perspective formation.

Some software labeled “integrated learning” may be only a cluster of activities related to a subject area without consideration for development of concepts and goals.

Technology powerful classrooms have been shown to have positive effects on the instructional process, on basic and advanced skills. To be effective it must become part of the whole educational environment. Studies have shown the following gains made by students (Bialo & Sivin-Kachala, 1996 and Dwyer, 1994).

- Exploration and representation of information was expressed dynamically and in many forms
- Students became socially aware and more confident
- Students communicated effectively about complex processes.
- Students became independent learners and self-starters.
- Students worked well collaboratively.
- Students knew their areas of expertise and shared spontaneously.
- Students used technology routinely and appropriately.
- Students increased writing skills.
- Students gained a better understanding and a broader view of math.
- Students gained an ability to teach others this new knowledge.
- Greater problem solving and critical thinking skills were obtained (Kosakowski 1998).

Considerations

What appropriate use of technology looks like for young children?

- Sending an e-mail to a relative who lives overseas
- Submitting one’s story to a children’s web site
- Using the internet as a source of news and weather
- Using children’s CD-ROM books for exploring and interacting
- Taking a virtual visit to a museum or historical location
- Interacting with a primary source of information, for example, meteorologist, astronaut, congresswoman, librarian, historian, neighbor or relative
- Becoming an explorer of safe informational web sites for problem solving on real world issue; for example, how to assist in a project on endangered species
- Listening to a story she write being read back to her (especially useful for children with visual impairments)
- Using the Internet for evaluation and ordering of consumer goods.
- Creating a multi-media presentation of a group project
- Using the tools of technology for student-led conferences
- Creating pieces of art, music, or literature using the tools of technology
- Understanding there are quality sources of information and how to recognize them among the vast amounts of information available
- Keeping a personal portfolio of work
- Using the informational tools of technology to sort, order or classify information for a real world problem
- Communicating and transferring information using multiple tools of technology

What inappropriate use of technology looks like for young children?

- Using a computer for reasons other than planned, goal specific work or related exploration
- Expecting students to operate equipment without receiving the adequate instruction on operation and application
- Expecting students to rely only on their peers for support and coaching
- Using technology exclusively for learning concepts and skills, without teacher instruction
- Not providing an environment for exploration that is free of violence and stereotyping
- Expecting children to grasp concepts from skill and drill software
- Not allowing students the use of technology for authentic work in problem solving real issues
- Using technology exclusively for training in computer literacy skills
- Using the computer as a reward or means of discipline

The rapid growth rate of technology continues to challenge educators in professional development. As a facilitator of appropriate use and exploration of technology, educators need not feel overwhelmed by every new piece of hardware or software. By becoming a co-learner in inquiry/investigation processes, the educator models appropriate use of multiple media resources. Students then gain insight and experiences in processing information.

References

Bialo, E. & Sivin-Kachala, J. (1996*). The effectiveness of technology in schools: A summary of recent research*. Washington, DC: Software Publishers Association.

Dwyer, D. (1994). Apple classrooms of tomorrow: What we've learned. *Educational Leadership, 51*(7), 4–10.

Forman, G., & Gandini, L. (1994). Video, *The amusement park for birds*. [Videotape] Reggio Emilia, Italy.

NAEYC. (1996). *Technology and young children—ages 3 through 8*. A position statement of the National Association for the Education of Young Children.

Perry, B. (1999). Bruce Perry discusses effects of technology on the brain. *Scholastic Early Childhood Today,* p. 38.

Shade & Watson. (1990). Computers in early education: Issues put to rest, theoretical links to sound practice, and the potential contribution of microworlds. *Journal of Educational Computing Research* 6(4): 375–392.

Using technology to enhance engaged learning for at-risk students. [Online] Available: North Central Regional Education Laboratory. (1999, May.)